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PROJECTS

Correspondence and manuscripts relating to article-length descriptions of large-scale projects involving one or several scholars should be addressed to the department editor, Dr. I. Grattan-Guinness, 34 Hillside Gardens, Barnet, Herts EN5 2NJ, England. Brief announcements of short-term projects, including doctoral theses in progress or recently completed, proposals, and requests for information or assistance may be sent either to the department editor or the HISTORIA editorial office.

A BIOBIBLIOGRAPHY OF BRITISH MATHEMATICS AND ITS APPLICATIONS UP TO 1850

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In spite of the increasing interest and scholarly work in the history of science, and especially of mathematics, in recent years, there remains a critical lack of basic reference tools in general, and bibliographies especially. It is hoped that the proposed *Biobibliography* will provide a useful tool for historians, bibliographers, social and natural scientists, and all those interested in the development of our culture. The aim is to list every book and article published in Britain or in English in the field of mathematics and its applications in the period concerned. Since specialisation in science developed only at the end of the period, works in allied fields like electricity, astronomy, accounting, surveying and mensuration will be included. Publications on mathematical instruments, forerunners of the computer, are covered.

The *Biobibliography* has been deliberately planned on a wide scale to facilitate a large variety of uses. The coverage is intended to be comprehensive rather than selective, including all levels from the beginning arithmetic to the research treatise. Inevitably most histories concentrate on the few works which contributed new knowledge and ignore the much larger number of less innovative works. The *Biobibliography* will list works used by the eighteenth-century craftsman as well as those consulted by the Fellow of the Royal Society. Craftsmen often had books like the popular *Companions*, which are included because they had a section on mathematics. These men were more likely to read a general periodical such as *The Ladies' Diary*, which included much non-technical material, than the more specialised *Philosophical Transactions*. Articles in the latter have been listed, but many other less known periodicals have been culled. The more mathematical serials have been listed by Archibald, but there were many others that contain mathematical material. One

example is *Nicholson's Journal* [Lilley 1948], which later united with the better known *Philosophical Magazine*.

Hitherto we have had to rely on a number of bibliographies and catalogues, all deficient in various serious aspects, or upon biographies and histories with inadequate bibliographical coverage. In the appendix to this report is included a small selection of these works. Poggendorff contains less than one-sixth of the authors to be treated in the *Biobibliography*. Taylor has about twice that coverage, although with weaknesses discussed in Wallis [1967]. Riccardi contains less than half the British Euclids, often with few details. The standard British bibliographical authorities (such as Allibone, Ames, Hazlitt, Lowndes, Watt) are often helpful, as are the national bibliographies, which may have details of translations of British works. There is also useful information in bibliographies in allied fields like astronomy, electricity, instruments, and tables. In addition, bibliographies for English language, children's literature or even conjuring can yield relevant material. Library and sale catalogues can provide useful information, but vary considerably in quality.

It is clear from the above that the bias of this work is bibliographical rather than biographical. However, brief biographies will indicate the main posts held by the author and also refer to his non-mathematical publications. For more information the reader will be directed to special works and particular articles, as well as to standard biographical sources, such as the well known *Dictionary of National Biography* or *Dictionary of Scientific Biography* (in process). The writers are listed chronologically according to the date of the first mathematical publication. For each year anonymous works are given first, and then the relevant writers appear in alphabetical sequence. The nearly five thousand known authors are distributed chronologically according to the following table:

Number of New Authors by Decades

before 1551	1551 - 26	1651 - 134	1751 - 168
	1561 - 29	1661 - 91	1761 - 171
	1571 - 24	1671 - 113	1771 - 239
	1581 - 41	1681 - 121	1781 - 196
	1591 - 37	1691 - 121	1791 - 196
	1601 - 39	1701 - 104	1801 - 254
	1611 - 51	1711 - 101	1811 - 275
	1621 - 66	1721 - 125	1821 - 350
	1631 - 71	1731 - 136	1831 - 450
	1641 - 52	1741 - 161	1841 - 439
	1651	1751 - 176	1851 - 507
75	436	1262	3039

Total 4812

After the biographical section appear, in date order, all the known mathematical works by the same writer. Although there are some references to manuscripts, the *Biobibliography* is essentially confined to printed materials. Similarly mathematical instruments may be mentioned, but an instrument-maker secures inclusion only through a publication describing the instrument. Each item is represented by a reasonably, but not completely, full title; for articles the (abbreviated) title of the periodical, pagination and date follow. For books the imprint, usually place, printer, publisher(s) and/or bookseller(s), and date, is followed by the format, pagination and a list of locations, mostly in libraries in all parts of the world, with copies seen by the writer indicated specially. Notes refer to dedications, addresses, reviews, references and further bibliographical details when these are needed to distinguish between issues of the same work. The title is normally given only once, for the first edition, although changes are indicated, and subsequent issues and translations are listed in order before the next work. While the modal entry is one work in one edition, surprisingly many authors have more than a hundred items listed and the total number of works could approach fifty thousand.

It is planned to arrange the material in some ten chronological volumes. Apart from a final volume of indexes to subjects, printers and publishers, places and titles of anonymous works, there will be a narrative volume discussing a few of the problems illuminated by the previous volumes. These include cultural relations between Britain and other countries (e.g. France and the U.S.A.), books used in schools and universities, popular mathematics, important library collections, specialist booksellers, and the rate of growth of the subject. The figures in the above table show an approximately exponential increase in new authors per decade, ranging from 26 to 507 in three centuries. This factor of a 20-fold increase is less than the provisional figure of 30 announced in 1968, which was itself less than that given by other writers, based on a shorter, more recent period. The table can also be used to investigate deviations from the exponential law.

Space permits only the brief mention of three authors, chosen for their differences. *The Tractatus de Sphaera* of the Scot, Joannes de Sacro Bosco (or John of Holywood), was first printed in 1472, more than two centuries after the author's death. The 33 incunable editions of this elementary textbook of astronomy have been recorded. Less is known about the sixteenth-century versions (about one a year), and later Latin editions which continued to appear until 1656, from centres like Venice, Bologna, Milan, Paris, Leipzig, Cologne, Cracow, Wittenberg, Antwerp, Frankfurt, Lyons, Basel, and Leiden. No British edition is known, although continental copies, presumably easy to obtain, were used. Through the sixteenth century, vernacular translations appeared

in German, French, Italian, Portuguese and Spanish, but rather surprisingly not in English.

By contrast, the next work to be mentioned, the most common arithmetic for more than a century, *The Ground of Arts* by the Welsh mathematician Robert Record, appeared from the beginning in English and was a characteristic product of the Reformation. Again details of editions are difficult to ascertain, partly because D.E. Smith and others gave various dates without indicating their authority. Although such a book was naturally not much used outside Britain, it is worth mentioning that a misrecorded 1549 copy at the Paris Bibliothèque Nationale helped to redate one at the Bodleian Library, Oxford, previously dated 1542 in *S.T.C.* and elsewhere. There is now no doubt that the book first appeared in 1543. Details of publishers' and booksellers' malpractices, such as mixed editions, erasures and doctored dates, have been given elsewhere, but perhaps other copies lie in foreign libraries waiting to add to the story of this seminal book.

Newton is so clearly the outstanding British mathematician, that special mention is necessary. His importance is indicated by the large number of commentaries reflected in the Newton bibliography by G.J. Gray, first published in 1888 with 231 items, and increased to 412 in the second edition (1907). Although many of the commentaries will appear elsewhere in the *Biobibliography* under the appropriate author, it is also hoped to issue all the Newton material in a separate associated volume *Newtoniana*, which may be considered a third edition of Gray, enlarged by including articles and brought up to date. To facilitate references and future editions, the items are listed by decimal additions to Gray's numbers. The recently increased interest in Newton's work means that new items are being added regularly, giving a total of over three thousand now. One notable feature is the large number of foreign, and particularly Soviet, items.

The results obtained so far and briefly described above would have been impossible without much ungrudging assistance from librarians in all parts. The writer must acknowledge the financial and other assistance received or promised from various sources, which should enable him to have the first volume ready for the press in the next year. He would welcome the assistance of readers with specialised knowledge, and be pleased to consider queries about any part of the *Biobibliography*.

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NOTE: This is a revision of a paper presented to the XIIIth International Congress of the History of Science, Moscow, August 1971.

QUESTIONS ON MATHEMATICS IN AFRICA

By Claudia Zaslavsky, New York City

I should like to know whether any readers of the journal know of mathematicians who were born or lived in Africa south of the Sahara, prior to the twentieth century.

In my book *Africa Counts* I devote a chapter to the magic squares of Muhammad ibn Muhammad, al-Fullāni al-Kishnāwī al-Sūdām, as described in his manuscript "Bahjat al-Afaq..." written in 1732 in Katsina (now Nigeria). I had access only to page 1 and pages 91-94, copies of which Don Crowe had made for me from the manuscript in the Library of the School of Oriental and African Studies, University of London. I believe copies are also in the Khedival Library in Cairo, and in Morocco. Has the remainder of this manuscript been translated into English or other European languages? This might be a project for a mathematician who reads Arabic.